

The CMS Event Builder and Storage System

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The CMS event builder assembles events accepted by the first level trigger and makes them available to the high-level trigger. The event builder needs to handle a maximum input rate of 100 kHz and an aggregated throughput of 100 GBytes/s originating from approximately 500 sources. This paper presents the chosen hardware and software architecture. The system consists of 2 stages: an initial pre-assembly reducing the number of fragments by one order of magnitude and several independent Readout Builder (RU builder) slices. The RU builder is based on 3 separate services: the buffering of event fragments during the assembly, the event assembly, and the data flow manager. A further component is responsible to handle events accepted by the high-level trigger: the Storage Manager (SM) temporarily stores the events on disk at a peak rate of 2 GBytes/s until they are permanently archived offline. In addition, events and data-quality histograms are served by the SM to online monitoring clients. We discuss the operational experience from the first months of reading out cosmic ray data with the complete CMS detector.

Primary author: MOMMSEN, Remigius K (FNAL, Chicago, Illinois, USA)

Presenter: MOMMSEN, Remigius K (FNAL, Chicago, Illinois, USA)

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